

XXXV.—DOES THE GIANT WOOD SPIDER (*NEPHILA MACULATA*) LIVE MORE THAN ONE SEASON?

The Giant Wood Spider (*N. maculata*) is an extremely common species in the forests of Salsette Island. Towards the end of the rains it is in evidence everywhere and its great golden, glutinous web frequently forms an obstruction across jungle paths. With the approach of the cold season there is a decided decrease in their numbers and by the hot weather they have completely disappeared. What happens to them? It might be suggested that these spiders aestivate. If this were so, then during the next monsoon we should find numbers of adult spiders about the forest. As far as my observations go, they cannot support this supposition. No adult *Nephila* are to be seen during the early part of the rains, but young are about in plenty everywhere. They gradually increase in size till again we have the forests tenanted by large females hanging in their webs. This seems to indicate that the adults die out each year after a short span of life, to be replaced the following season by their brood! Further observation is necessary before this can be *definitely* proved. Perhaps the span of life may vary in different localities.

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XXXVI.—PARENTAL CARE AND CANNIBALISM IN ARACHNIDS.

On p. 411, vol. xxxviii of the *Journal*, Mr. E. E. Green makes a reference to and answers the old question, 'Do young scorpions eat their parent?' Mr. Green gives a very good reason why young scorpions would find it difficult and perhaps impossible to eat their mother, namely, on account of the tender condition of the young and the strongly chitinous plates of the mother—she would be a tough joint!

On several occasions I have found mother scorpions of the genera *Buthus* and *Palamnaeus* with young in various stages of development. The degree of development varied from the tender, creamy white, unchitinised young to young almost half the size of the parent, with chitinised plates fully developed. In all cases the young when not crowded together on the mother's back or near her would always retire together with her when disturbed. In all such cases the adults and young were in the best of conditions. This being the case I do not see any necessity for the young to exhibit cannibalistic propensities. If occasion did arise for such behaviour it would result from extreme hunger only, or there is another alternative possible, namely, the death of the parent or the young might occasion cannibalism, in the same way as ants of a species will eat their dead comrades, but I do not think that the young would deliberately kill the parent or vice versa. Eating the dead of the same species is of frequent occurrence in Nature.

Mr. Green, on the other hand, refers to his captive scorpion eating her offspring. Referring to this incident he adds, 'I do not suppose that this is a natural habit'; nor do I. Though provided with insect food, it seems possible that the insects were not of the right kind, in which case the cannibalism of the parent was occasioned by extreme hunger. Most female Arachnids are, as far as I am aware from actual experience, very solicitous of their egg and young.

Among the centipedes, parental care is strongly displayed by the commoner species of *Scolopendra*. In this case the female 'broods' her eggs by coiling her body round them. When the eggs are hatched she treats the young for a considerable time in the same way. If disturbed she very reluctantly leaves her charge but will soon return to it. If the eggs or young are exposed she will remove them to a place of safety. The young of these centipedes remain with the parent till well chitinated. The problem of their food is yet another matter. It seems probable that the parent brings food to the young at night, but further evidence is needed to prove this point.

Millipedes, unlike the centipedes, do not appear to 'brood' their eggs or young. In this case, a domed structure is constructed by the parent and a single egg laid within. Within this chamber the young millipede is hatched. How long it remains within its nursery is difficult to say. How it obtains its food is another problem as there is no entrance to the chamber!

The parental care exhibited by spiders is well known, but this varies in many directions. Some make a cocoon and are indifferent to its after care, others carry the cocoon about with them till the young are hatched, and others still not only carry the egg case but the young also till they are able to fend for themselves. A species which carries her young clustered round her abdomen is the large spider [*Heteropoda venatoria* (?)] commonly found in houses in Bombay. I once removed the egg case of the spider. She ran away but soon returned to the spot to which I had removed it, obviously to look for it. On my approach she again made off. I then got ahead of her and presented her with the egg case at the end of a pair of forceps, she immediately seized it. I then removed it again and placed it on the ground and watched. The spider immediately began to search for her egg case and eventually found it. She seized it and made off. I did not disturb her further.

While on the topic of spiders, I should like to refer to another phase of the Arachnid life, 'Do female scorpions and spiders eat their "husbands"?' This is as common a belief as the one mentioned above, but definite proof is yet awaited. The males of many Arachnids, particularly among the spiders are insignificant beings when compared with their females. They are small in size and frequently most unlike in general colour and form to the gentler sex. Their sole purpose in life appears to be the fertilization of the female, which, according to belief, they achieve at great personal risk—the risk of being ignominiously devoured! Among the web building spiders, the males usually keep to the

peripheral portion of the web as though they were really afraid of their larger spouses. Woe betide one of these 'bridegrooms' if he come within the grasp of his 'bride'. Are these males so foolish as to lay themselves open to such a fate? They are not so easily caught anyway. On her approach they move off to another quarter of the web—then again they are 'microscopical' to be dealt with easily and by far more active. Whether prospective 'bridegrooms' are eaten or not I am not prepared to answer definitely, but I shall relate a small observation and leave the reader to form his own conclusions, and then ask a question myself.

When going through the forest I came upon a female of the Giant Wood Spider (*Nephila maculata*) which had just cast its skin. She hung quite limp and helpless from the centre of her web—quite unable to move even when touched. Round about her were several males—all prospective 'bridegrooms'. The males chased each other about the web and away from the female; it was evidently a contest for superiority and possession of the female. In due course one of the males copulated with her. While copulation was in progress the unsuccessful males climbed all about the pair, but their action did not in any way disturb them. Unfortunately being pressed for time I could not complete my observation. Now for my question: Is it usual, when there is a disparity between the sexes in size for the males to avail themselves of the period of ecdysis to copulate? If this is so, then the males are not so imprudent as it would appear! They would have ample time to escape before the females became active. Further evidence is also required before we can definitely establish whether the males of Arachnids fall victims to the females when captured by the latter. There is the alternative suggestion that once the males have fulfilled their purpose in life they become exhausted and die, and it is then that the females finding the dead or dying utilise them as food in the same way as ants do.

In the Scorpions we do not find such a disparity in the sexes—there is really very little. This being the case I am disinclined to accept the belief that females devour the males after copulation till evidence is forthcoming. That fights occur between individuals and the vanquished is eaten is no proof that the males are eaten by females. I have kept separate cages of *Buthus* and *Palamnacus* and the individuals in each cage lived together for a considerable time on amicable terms. This does not support the belief that scorpions are cannibalistic in the true sense of the word—that they deliberately kill each other for food unless pressed by hunger. 'A kingdom divided against itself must fall' and this is very seldom the case in Nature.

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[Since writing the above I came across another instance of this nature in which copulation was effected during the limp period of the female following ecdysis.—C. McC.]